Sep 15, 2009

UNITIKA LTD.

Novel Polyolefin Cationic Emulsions

'ARROWBASE® C-series'

Unitika Ltd. has developed water-based polyolefin cationic emulsions 'ARROWBASE C-series', which have properties of adhesion, excellent water and chemical resistance, and high storage stability under acidic conditions.

Polyolefin resins are used as coating agents, paints, bonds. It is difficult to disperse polyolefin resins under acidic conditions. Unitika's advanced technology enabled stable polyolefin cationic emulsions with no additives such as surfactants or water-soluble polymers. We added C-series to our ARROWBASE product line, S-series and T-series (anionic series).

1. Water-based Emulsions

Water-based emulsions are environment friendly because they have a low amount of VOC (Volatile Organic Compound) such as toluene used as primers, coating agents, paints, bonds.

Unitika Ltd. developed functional aqueous polyolefin emulsions 'ARROWBASE S-series and T-series'. They have been used in lots of fields such as packaging, electric and electronic materials, architectural materials, and materials for energy generation. There are growing demands (for the water-based emulsions) to use under acidic conditions, or with acidic additives. 'ARROWBASE S-series and T-series' are anionic emulsions, so their dispersion stabilities are not good when used under acidic conditions, or with acidic additives.

Urethane and Acryl resin cationic emulsions are already known. When we use them under acidic conditions, they show poor adhesion to polyolefins (PEs and PPs) and their films poor resistance against water and chemicals. To satisfy the demands of the customers, Unitika Ltd. has developed new water-based emulsions 'ARROWBASE C-series', which have excellent storage stability under acidic conditions, excellent adhesion, excellent water and chemical resistance of the film.

2. Advantages of ARROWBASE C-series

1 Excellent storage stability under acidic conditions

ARROWBASE C-series show excellent storage stability under acidic conditions.
Can be mixed with acidic additives.

2 Excellent adhesion to various substrates

ARROWBASE C-series film has excellent adhesion to various substrates such as plastics (polyolefin, polyester, polyamide), metals, glasses, and paper.

3 Excellent water and chemical resistance

ARROWBASE C-series film has excellent water (caustic, acid) and chemical resistance.

4 Soap-free

ARROWBASE C-series have no hydrophilic or nonvolatile compounds such as surfactants and water-soluble polymers. Therefore, the film is contaminant-free.

3. Usage

1) Surface modifiers
2) Fiber modifiers
3) Paints for electrode
4) Media for ink-jet printing

4. Sales Plan

Marketing is started from September 2009.

5. Inquiries about the Products

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‘ARROWBASE® C-series’

ARROWBASE C-series are polyolefin cationic emulsions, having many excellent characteristics as follows.

1. Excellent storage stability under acidic conditions

AS ARROWBASE C-series are cationic emulsions, they have good storage stability under acidic conditions (Table1). They can be mixed with acidic additives.

2. Excellent adhesion to various substrates

ARROWBASE C-series film has excellent adhesion to various substrates (Table2).

3. Excellent water and chemical resistance

ARROWBASE C-series film has excellent water resistance and chemical resistance (Table3).

4. Soap-free

ARROWBASE C-series have no hydrophilic nonvolatile compounds such as surfactants and water-soluble polymers. Therefore, the film is contaminant-free.

Properties

Table1 Properties of ARROWBASE C-series

Items	Units	CB-1200 (High-adhesion type)	CD-1200 (Solvents-resistant type)
Base Resin	-	modified PE	modified PE
Appearance	-	milky liquid	milky liquid
Solid Content	wt%	23	20
Viscosity	mPa·S	130	130
Particle size	nm	70	80
pH	-	3.0	3.0
Agent Content	wt%	20 (IPA)	20 (IPA)

The data above are not intended to guarantee the properties in a particular application.

Other grades are under developing .

Adhesion

Table2 Cross-cut Adhesion Test# of ARROWBASE C-series

Base material	CB-1200	CD-1200	cationic urethane emulsion	cationic acrylic emulsion
PP	100	97	0	12
PE	100	95	0	100
PET	100	100	55	100
Aluminum	100	100	16	100

Thickness of Coat Layer: 5μm

The number of grid per 100 that is not delaminated by the tape

Chemical resistance

Table3 Durability test of ARROWBASE C-series

VS		CB-1200	CD-1200	cationic urethane emulsion	cationic acrylic emulsion
Water		Good	Good	Bad	Bad
Agents	MEK	60	100	60	70
	Toluene	0	100	0	60
	Caustic	100	100	0	0
	Acid	100	100	0	0

Initial ARROWBASE film thickness: 10μm

Water: State of the film in water(60 degC) after 2days (Good：No change, Bad：Solved or delaminated).

MEK (=MethylEthylKetone): Residual thickness of the film in MEK(50 degC) after 2days.

Toluene: Residual thickness of the film in toluene(40 degC) after 2days.

Caustic: Residual thickness of the film in 17wt% KOHaq(40 degC) after 8days.

Acid: Residual thickness of the film in 25wt% H_2SO_4aq(40 degC) after 8days.